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**REMARKS**

Claims 1-22 were pending in this application.

Claims 21 and 22 have been allowed.

Claims 1, 2, 4, 5, 7-9, 11, 14-16, and 18 have been rejected.

Claims 3, 6, 10, 12, 13, 17, 19, and 20 have been objected to.

Claims 7 and 14 have been amended as shown above.

Claims 1-22 remain pending in this application.

Reconsideration and full allowance of Claims 1-22 are respectfully requested.

**I. ALLOWABLE CLAIMS**

The Applicants thank the Examiner for the indication that Claims 21 and 22 are allowable. These claims have not been amended and therefore remain in condition for allowance.

The Applicants also thank the Examiner for the indication that Claims 3, 6, 10, 12, 13, 17, 19, and 20 would be allowable if rewritten in independent form to incorporate the elements of their respective base claims and any intervening claims. Because the Applicants believe that the remaining claims in this application are allowable, the Applicants have not rewritten Claims 3, 6, 10, 12, 13, 17, 19, and 20 in independent form.

**II. REJECTION UNDER 35 U.S.C. § 102**

The Office Action rejects Claims 1, 2, 4, 5, 7-9, 11, 14-16, and 18 under 35 U.S.C.

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§ 102(a) as being anticipated by Wanlu et al., "Applying Multiresolution Analysis for Processing of Hydraulic Pump Fault Signal" ("*Wanlu*"). This rejection is respectfully traversed.

A prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. (*MPEP* § 2131; *In re Bond*, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990)). Anticipation is only shown where each and every limitation of the claimed invention is found in a single prior art reference. (*MPEP* § 2131; *In re Donohue*, 766 F.2d 531, 534, 226 U.S.P.Q. 619, 621 (Fed. Cir. 1985)).

Claims 1, 8, and 15 recite that a signal is decomposed into a "plurality of resolution levels," the resolution levels are grouped into a "plurality of groups," and one or more defect indicators are identified "using the groups."

The Office Action asserts that three portions of *Wanlu* disclose these elements of Claims 1, 8, and 15. However, the cited portions of *Wanlu* only establish that *Wanlu* decomposes signals into multiple "layers." The cited portions of *Wanlu* lack any mention of grouping the layers into "a plurality of groups" and then identifying one or more defect indicators "using the groups" as recited in Claims 1, 8, and 15.

As noted previously, *Wanlu* simply recites that a signal *s* is decomposed into multiple layers *d1-d3* and *a3*. These layers are then "smoothed" or processed to eliminate noise, and the processed layers are recombined to form a signal *s1*. The signal *s1* is then decomposed again into multiple layers *d1-d10* and *a10*. Each of the layers *d1-d10* and *a10* is associated with a different frequency band. A fault characteristic frequency of 24.67Hz falls within one of the

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layers d1-d10 and a10 (layer d8 corresponding to a frequency band of 19.53Hz – 39.06Hz). (*Wanlu*, Sections 5 and 6).

The Office Action ignores the express statements in *Wanlu* about the fault characteristic frequency being extracted from a single layer d8. Instead, the Office Action cites three portions of *Wanlu* allegedly disclosing the grouping of layers and the identification of defect indicators using groups of layers. However, the three portions of *Wanlu* cited by the Office Action lack any mention of grouping the “layers” of *Wanlu* into a “plurality of groups” and then identifying one or more defect indicators using those “plurality of groups.”

The first portion of *Wanlu* cited by the Office Action is the Abstract. The Office Action appears to put special emphasis on the portion of Abstract stating that “signal wavelet decomposition-reconstruction algorithms based on the multi-resolution analysis are studied.” However, the entire Abstract simply summarizes exactly what the Applicants stated above. *Wanlu* decomposes a signal *s* into multiple layers d1-d3 and a3, eliminates noise in the layers d1-d3 and a3, and recombines the layers d1-d3 and a3 to form a signal *s1*. *Wanlu* then decomposes the signal *s1* into multiple layers d1-d10 and a10 and extracts the fault frequency characteristic from one of those layers (layer d8).

The Abstract of *Wanlu* says absolutely nothing about grouping resolution levels into “a plurality of groups” and then identifying one or more defect indicators using the “plurality of groups.” At most, the Abstract of *Wanlu* indicates that a single group of “layers” (d1-d3 and a3) are used to reconstruct a signal *s1*. A single group of layers in *Wanlu* does not anticipate the “plurality of groups” of “resolution levels” recited in Claims 1, 8, and 15. Reconstructing a

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signal  $s1$  in *Wanlu* does not anticipate identifying one or more defect indicators using a “plurality of groups” of “resolution levels” as recited in Claims 1, 8, and 15. As a result, the Abstract of *Wanlu* fails to anticipate these elements of Claims 1, 8, and 15.

The second portion of *Wanlu* cited by the Office Action is page two, right column, lines 19-37. This portion of *Wanlu* is describing “decomposition formulas.” In other words, this portion of *Wanlu* is describing the formulas used to decompose the signal  $s$  into layers  $d1-d3$  and  $a3$  or to decompose the signal  $s1$  into layers  $d1-d10$  and  $a10$ . In particular, Formula (12) defines  $Af(t)$ , which represents the low-frequency layer ( $a3$  in Figure 1 or  $a10$  in Figure 2). Formula (13) defines  $Df(t)$ , which represent the higher-frequency layers ( $d1-d3$  in Figure 1 or  $d1-d10$  in Figure 2).

Nothing in this portion of *Wanlu* describes how the decomposed layers are processed after decomposition. Instead, this portion of *Wanlu* is specifically directed at describing how a signal is decomposed into multiple layers. This portion of *Wanlu* never mentions a “plurality of groups” of resolution levels or one or more defect indicators that are identified using those “plurality of groups.” As a result, this portion of *Wanlu* also fails to anticipate these elements of Claims 1, 8, and 15.

The third portion of *Wanlu* cited by the Office Action is page four, left column, second paragraph. This portion of *Wanlu* describes how the signal  $s$  is decomposed into layers  $d1-d3$  and  $a3$ , the layers  $d1-d3$  and  $a3$  are “smoothed” to remove noise, and the smoothed layers  $d1-d3$  and  $a3$  are recombined to form the signal  $s1$ .

At most, the Office Action could use this portion of *Wanlu* as disclosing a single group of

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layers (layers d1-d3 and a3), where that single group is used to reconstruct a signal  $s/$ . However, the group of layers d1-d3 and a3 cannot anticipate the “plurality of groups” of resolution levels recited in Claims 1, 8, and 15. Also, the use of the layers d1-d3 and a3 to reconstruct a signal  $s/$  does not anticipate identifying one or more defect indicators using the “plurality of groups” as recited in Claims 1, 8, and 15.

The only time *Wanlu* might identify an “indicator” of a defect is when *Wanlu* uses one of the layers d1-d10 and a10 in Figure 2 to extract a fault characteristic frequency. This is discussed in detail in Section 6 of *Wanlu*. This section of *Wanlu* clearly recites that the fault characteristic frequency is extracted from one of the layers d1-d10 and a10 (layer d8). This section of *Wanlu* lacks any mention of using multiple “groups” of layers to identify one or more defect indicators. Not only that, when summarizing its disclosure, *Wanlu* specifically states that a “certain specific frequency component can be extracted” using wavelet decomposition. (*Wanlu*, Section 7, Third paragraph). This clearly indicates that *Wanlu* is only extracting one frequency component from a single one of the layers d1-d10 and a10 in Figure 2.

It is improper for the Office Action to use other portions of *Wanlu* in an attempt to modify the express and clear teachings of Section 6 in *Wanlu*. Section 6 of *Wanlu* specifically states that the fault characteristic frequency is extracted in a single layer (layer d8). This means *Wanlu* cannot possibly anticipate grouping resolution levels into “a plurality of groups” and identifying one or more defect indicators using those “plurality of groups” as recited in Claims 1, 8, and 15.

In effect, the Office Action simply cites three portions of *Wanlu* and claims that these

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portions anticipate grouping "resolution levels" into multiple "groups" and identifying defect indicators using the multiple "groups." However, as noted above, Section 6 of *Wanlu* expressly states that the fault frequency characteristic is extracted in a single layer. Moreover, none of the cited portions of *Wanlu* even mentions the word "group." The Office Action has not cited any portion of *Wanlu* showing that "resolution levels" are grouped into a "plurality of groups" and that one or more defect indicators are identified using those "plurality of groups" as recited in Claims 1, 8, and 15.

For these reasons, *Wanlu* fails to anticipate the Applicants' invention as recited in Claims 1, 8, and 15 (and their dependent claims). Accordingly, the Applicants respectfully request withdrawal of the § 102 rejection and full allowance of Claims 1, 2, 4, 5, 7-9, 11, 14-16, and 18.

### III. CONCLUSION

The Applicants respectfully assert that all pending claims in this application are in condition for allowance and respectfully request full allowance of the claims.

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**SUMMARY**

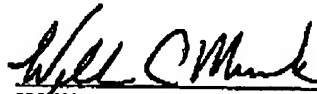
If any issues arise, or if the Examiner has any suggestions for expediting allowance of this application, the Applicants respectfully invite the Examiner to contact the undersigned at the telephone number indicated below or at [wmunck@davismunck.com](mailto:wmunck@davismunck.com).

The Commissioner is hereby authorized to charge any fees connected with this communication (including any extension of time fees) or credit any overpayment to Deposit Account No. 50-0208.

Respectfully submitted,

DAVIS MUNCK, P.C.

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